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L6: Entry 14 of 15   File: USPT   Nov 13, 2001

DOCUMENT-IDENTIFIER: US 6317438 B1
TITLE: System and method for providing peer-oriented control of telecommunications services

Detailed Description Text (138):
In the area of architecture, Lakshman and Yavatkar (1996) described AQUA which is an adaptive end-system QoS architecture. AQUA provides a framework for managing resources such as CPU, network interface, memory, and bus bandwidth. The researchers asserted that the "significant and novel contributions of AQUA include an adaptation framework, QoS specification, resource managers, and an application level QoS manager that performs application-based graceful adaptation when resource requirements change or the demand for resources exceeds available capacity." A further contribution was a CPU management algorithm called RAP (Rate-based Adjustable Priority Scheduling) that provides predictable service and dynamic QOS control.

Detailed Description Text (140):
Under the mechanism classification, the papers selected were either associated with protocols and client/network boundary issues or with aspects of flow control. Within the client/network category, there were three papers of particular interest. The first, by Campbell and Coulson (1997), described the implementation of an adaptive transport system that incorporates a QoS-oriented API and a range of QoS mechanisms that assist multimedia applications in adapting to fluctuations in the delivered network QoS. The second paper by Ferrari, Ramaekers and Ventre (1992) investigated the feasibility of providing an extended client interface that allows more flexibility in the client-network interactions. The researchers claimed that "the proposed model improves the utilization of network resources, and increases the network's capability to support multimedia traffic, while continuing to offer a guaranteed quality of service." The final paper by Lowery (1991) proposed a real-time delivery system composed of a new protocol for administration of real-time connections combined with modifications to the Internet Protocol (IP) to support such connections.

Detailed Description Text (158):
The other perspective, that of resource acquisition, is even more intriguing in its potential for offering the type of potential economic benefits that are sufficient to warrant changes to network architecture. There are three papers which were particularly helpful in understanding this potential. The first by Kashper and Watanabe (1995) set the foundation of feasibility by discussing the issue of dynamic routing in multiple carrier international networks. The work by Gustafsson and Karlsson (1997) can be viewed as building on the basic capability of dynamic routing as they surveyed the literature on traffic dispersion, a technique in which "the traffic from a source is spread over multiple paths and transmitted in parallel through the network." The authors suggested that "traffic dispersion may help in utilizing network resources to their full potential, while providing quality-of-service guarantees." Shultz, Incollingo, and Uhrig (1997), however, opened up a whole new range of possibilities with their discussion of how to take advantage of differences in ATM services and differences in tariffs for different service types as well as for the same type of service from different carriers. Taken together, these three papers provide the conceptual framework for an

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infrastructure capability that allows for the economic optimization of network resources used in provisioning a service created by collaborating users. This capability would require some adjustments to existing network architectures to fully exploit the potential; however, the anticipated benefits appear significant enough to consider such changes.

Detailed Description Text (163):
Beyond these foundation works, there were several useful papers that dealt with more tightly focused issues. Ramaekers and Ventre (1992) discussed QoS negotiation in real-time communication networks. The authors "present a new mechanism for the establishment of real-time connections in a quality-of-service network developed for the Tenet real-time protocol suite." Farkouh (1996) covered some of the issues related to ATM virtual path connection (VPC) and virtual channel connection (VCC) performance, fault, and traffic management functions. Friesen, Harms, and Wong (1996) covered an approach to resource management by utilizing the virtual path constructs defined for ATM networks. Using the virtual path concept, the authors proposed organizing a logical overlay network. The authors pointed out that "if the VPCs are permanent or semi-permanent and have reserved capacity, establishing new VCCs requires simple connection admission decisions at the VPC terminators of existing VPCS." This work provided a survey of articles on resource management using the virtual paths in an ATM network.

Detailed Description Text (236):
Tracks resource utilization by participating device

Detailed Description Text (238):
Can monitor and report on service QoS in relation to SLAs

Detailed Description Text (263):
Along with the notion of multiple intervening domains, which may be owned or controlled by different entities, comes the problem of accountability for resource utilization. The final objectives within this first category address issues related to this aspect of the infrastructure. All of the objectives and issues relating to domains (which include issues related to edge networks) and resource accounting are best considered within the conceptual context provided by FIG. 1.

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